WHAT IS CLAIMED IS:

1. An electromagnetic radiation diffuser comprising:

a substrate having a first and a second surface, said first surface having a structure with a three dimensional profile of individual grid units;

a reflective coating formed on said first surface, wherein said reflective coating conforms to said structure; and

an absorptive grating formed on said reflective coating, said absorptive grating including spaces;

wherein said absorptive grating absorbs a first portion of the electromagnetic radiation, while a second portion of the electromagnetic radiation passing through said spaces is diffusely reflected by said reflective coating.

2. The apparatus of claim 1, wherein said individual grid units have randomly selected heights over a predetermined range.

3. The apparatus of claim 2, wherein said predetermined range is approximately 50 nanometers.

4. The apparatus of claim 2, wherein said individual grid units each have an area of approximately 100 nanometers by 100 nanometers.

5. The apparatus of claim 2, wherein said absorptive grating is oriented diagonally across said individual grid units.

6. The apparatus of claim 5, wherein said absorptive grating is approximately 3.2 microns wide and repeats approximately every 6.4 microns.

7. An electromagnetic radiation diffuser comprising:

a substrate having a first and a second surface, said first surface having a structure with a three dimensional profile of individual grid units;

a reflective coating formed on said first surface that conforms to said structure and diffusely reflects extreme ultraviolet radiation; and

an absorptive grating formed over said reflective coating wherein said absorptive grating absorbs a first portion of the electromagnetic radiation, while a second portion of the electromagnetic radiation passing through spaces between said absorptive grating is diffusely reflected by said reflective coating.

8. The diffuser of claim 7 wherein said individual grid units have randomly selected heights over a predetermined range.

9. The apparatus of claim 8, wherein said predetermined range is approximately 50 nanometers.

10. The apparatus of claim 8, wherein said individual grid units are approximately 100 nanometers by 100 nanometers.

11. The apparatus of claim 7, wherein said absorptive grating is oriented diagonally across said individual grid units.

12. The apparatus of claim 7, wherein said absorptive grating is approximately 3.2 microns wide and repeats approximately every 6.4 microns.

13. A method for making an electromagnetic radiation diffuser on a substrate, comprising:

(a) fabricating in a first surface of the substrate a three dimensional profile of individual grid units;

(b) forming a reflective coating over said three dimensional profile that conforms to said three dimensional profile; and

(c) forming an absorptive grating over said reflective coating.

14. The method of claim 13, further comprising:

randomly selecting heights for said individual grid units; and

fabricating said individual grid units according to said randomly selected heights.

15. The method of claim 14, wherein said randomly selecting step randomly selects said heights of said individual grid units such that said heights range from 0 to approximately 50nm.

16. The method of claim 14, comprising fabricating individual grid units that have an area of approximately 100 nanometers by 100 nanometers.

17. The method of claim 13, further comprising orienting said absorptive grating diagonally across said individual grid units.

18. The method of claim 13, wherein said forming an absorptive grating step forms an absorptive grating portion approximately 3.2 microns wide over said reflective coating and repeating an absorptive grating portion approximately every 6.4 microns.

19. A lithography system comprising:

an electromagnetic radiation source;

an electromagnetic radiation diffuser positioned at a first optical plane, said diffuser having a substrate with a three dimensional profile of individual grid units that are covered by a reflective coating that conforms to said substrate, wherein said reflective coating is further covered by an absorptive grating for absorbing a first portion of said electromagnetic radiation, while a

second portion of said electromagnetic radiation passing through spaces between said absorptive grating is diffusely reflected by said reflective coating; and

an electromagnetic radiation sensor positioned at a second optical plane;

wherein electromagnetic radiation incident on said diffuser is diffusely reflected and received at said sensor.

20. The lithography system of claim 19, wherein said electromagnetic radiation source is an extreme ultraviolet radiation source.

21. The lithography system of claim 19, wherein said first optical plane is a reticle plane.

22. The lithography system of claim 19, wherein said second optical plane is a wafer plane.

23. The system of claim 19, wherein said individual grid units have randomly selected heights over a predetermined range.

24. The system of claim 23, wherein said predetermined range is 50 nanometers.

25. The system of claim 23, wherein said individual grid units have an area of approximately 100 nanometers by 100 nanometers.

26. The apparatus of claim 19, wherein said absorptive grating is oriented diagonally along said individual grid units.

27. The apparatus of claim 19 wherein said absorptive grating is approximately 3.2 microns wide and repeats approximately every 6.4 microns.